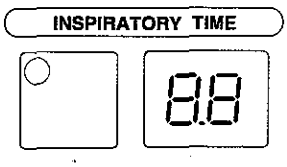
Example:

Settings:	**TIDAL VOLUME**	**0.60 Liters**
	PEEP	**5 cmH2O**
	COMPLIANCE COMP	**3.0 ml/cmH2O**

Observed end inspiratory pressure of last breath = 40 cmH2O

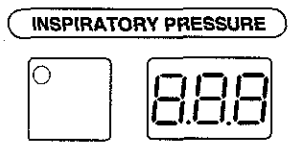
V_{added} = (3.0) x (40 - 5) = 105 ml

$V_{delivered}$ = 105 + 600 = 705 ml



Inspiratory Time

Panel Group: Upper Controls
Range: 0.1 to 5.0 seconds
Increment: 0.1 seconds
Default: 0.1
Modes Used in: Pressure Control and PC-SIMV
The duration of time during which the inspiratory pressure is maintained at the sum of INSPIRATORY PRESSURE plus PEEP. The built-in I:E LIMIT alarm may cause a termination of inspiration before the full INSPIRATORY TIME elapses if the limit is reached.

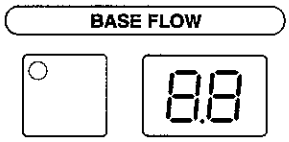


Inspiratory Pressure

Panel Group: Upper Controls
Range: 0 to 80 cmH2O
Increment: 1 cmH2O
Default: 0
Modes Used in: Pressure Control and PC-SIMV and anytime pressure augmentation is activated.

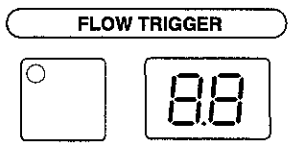
The INSPIRATORY PRESSURE control determines the inspiratory pressure level attained during a pressure controlled or pressure augmented breath, for example, in the pressure control mode, this control (combined with the PEEP setting) determines the peak inspiratory pressure level.

The INSPIRATORY PRESSURE control is also used in PRESSURE AUGMENTATION of volume-controlled breaths. When this control level is set above zero and the pressure augment function is on, the inspiratory pressure of all volume-controlled breaths in both ASSIST CMV and SIMV will be greater than or equal to the sum of INSPIRATORY PRESSURE plus PEEP.



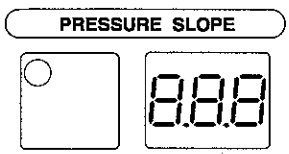
Base Flow

Panel Group: Upper Controls
Range: 0, 2 to 20 LPM
Increment: 1 LPM
Default: 0
Modes Used in: All
The BASE FLOW control is available in all modes. When this control is set to a value greater than 0 LPM, a low level of continuous flow will be delivered to the Patient Circuit during the exhalation phase of the breath. BASE FLOW begins at 100 msec from the start of exhalation.



Flow Trigger

Panel Group: Upper Controls
Range: 1 to 10 LPM
Increment: 0.5 LPM
Default: 2 LPM
Modes Used in: All (If base flow is activated)
The FLOW TRIGGER control is enabled when the BASE FLOW control is set to a value greater than 0 LPM. An inspiratory effort results in a reduction in the flow measured by the flow sensor. When this reduction exceeds the clinician selected FLOW TRIGGER level, a breath is initiated.



Pressure Slope

Panel Group: Upper Controls
Range: -9 to 0 to 9, P–9 to P0 to P9 (Pediatric)
Increment: 1
Default: 0
Modes Used in: All
PRESSURE SLOPE permits the clinician greater control in shaping the pressure waveform. This fine tuning changes the speed with which the inspiratory pressure level is achieved. The speed of the pressure rise is controlled by the initial flow rates and flow adjustment response rate. It can thereby influence the degree of patient comfort (via increased ventilator-patient synchrony) on all breaths regulated by pressure. Included in these pressure-regulated breaths are:

- pressure-supported breaths,
- pressure-controlled breaths (in the Pressure Control and PC-SIMV modes),

- flow- and volume-augmented breaths (where the reference inspiratory pressure is the baseline pressure),
- pressure-augmented breaths (where the reference inspiratory pressure is baseline plus INSPIRATORY PRESSURE), and
- spontaneous breaths (where the inspiratory pressure is the baseline pressure.)

The default value for PRESSURE SLOPE is zero, and many clinicians may wish to leave this setting at zero which may be standard for average adult patients. However, when using a pediatric circuit, the average setting should be P0 (which stands for Pediatric zero). This enables the clinician to maintain desired tidal volumes even during pressure support of smaller pediatric patients.

NOTE

The PRESSURE SLOPE control may be used to select Adult or Pediatric settings. Selecting values in the current range is done in standard fashion. However, to switch from Adult to Pediatric ranges (and back), the clinician must press and hold the PRESSURE SLOPE key while turning the SET knob to the desired range and setting.

The relationship among all the pressure slope settings is depicted in the Figure 5-1. Notice that, in general, pediatric settings exhibit slower pressure slopes (ie, slower initial flow response) than adult settings. Beside this general difference, the two ranges also have been individually fine-tuned to provide pressure breaths optimally for pediatric and adult patients.

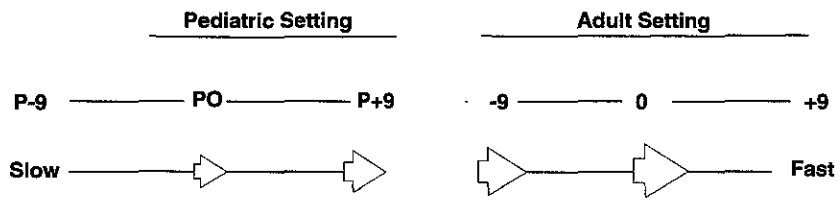


Figure 5-1 • Pressure Slope Settings

Any adjustments above or below the midpoints for adult (0) and pediatric (P0) patients enable the clinician to fine tune the leading edge of the pressure waveform to increase patient comfort and patient tidal volumes.

A variety of waveforms are achievable with this control setting and are shown in Figure 5-2. To determine exactly which waveform any particular patient experiences at any given setting

level for this PRESSURE SLOPE control, use a graphic display of the proximal airway pressure. Note that the graphic of the pressure slope varies substantially between a test lung and a patient.

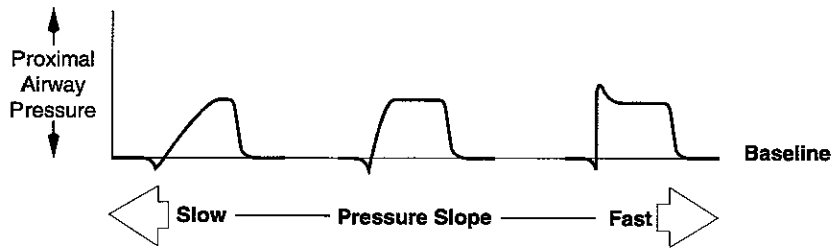


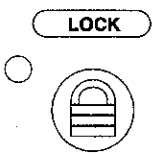
Figure 5-2 • Pressure Supported Breaths

As Figure 5-2 suggests, numerical readouts for PRESSURE SLOPE merely represent relative speeds (slow [-9] to fast [+9]) and not absolute values for the slope of the pressure waveform. The actual waveform experienced by each patient will be highly dependent upon:

- endotracheal tube size,
- patient airway resistance,
- both the lung and circuit compliance, and
- patient demand.

WARNING

Adjust the PRESSURE SLOPE down into the pediatric range (indicated by "P" in the Control's LED) when using the BEAR® 1000 Ventilator on pediatric patients (with endotracheal tube sizes in the range below 6 or 5 mm and with use of a pediatric circuit). In the absence of such an adjustment, proximal pressures may rapidly oscillate and result in hypoventilation.



Control Lock

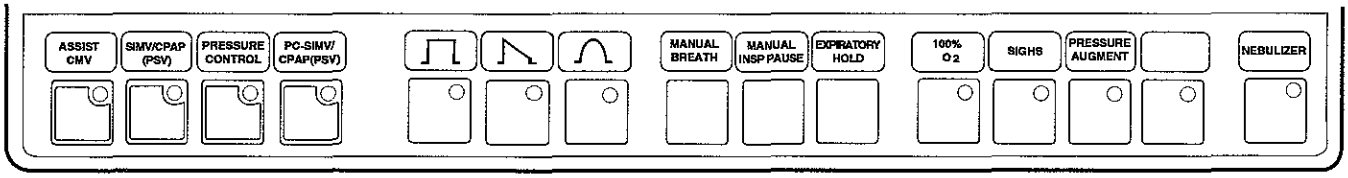
Panel Group: Upper Controls
Range: on, off
Modes Used in: All

CONTROL LOCK helps the clinician avoid inadvertent changes to Upper and Lower Control Group settings. When the CONTROL LOCK LED indicator is lit, no setting changes can be made to the Control Group keys. However, the clinician can still view control settings. Even when CONTROL LOCK is enabled, three settings in the Control Group can still be used: MANUAL BREATH, 100% O_2 and CONTROL LOCK itself.

Set Knob

Panel Group: Upper Controls
Range: 360°
Modes Used in: All
The green SET knob is used to adjust setting levels of the Upper Control Group keys. This knob controls the level of the control key with a flashing LED indicator. Only one such key can flash at any given time; so, only one level can be adjusted at a time. Turn this knob clockwise to increase a setting and counterclockwise to decrease a setting.

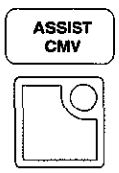
When turning the setting level to the high or the low extremes of the control range, a low audible tone indicates the end of the range.



LOWER CONTROLS

The Lower Control Group is the last row in the green area of the BEAR® 1000 Ventilator front panel. The keys at the left of this group are the ventilatory mode keys. They can be set in one of three ways: "off," "setup" or "on." When a mode is off, its key LED is also off. When a mode is on (or operating), its key LED stays on, and since only one mode can be operating at any given time, only one mode LED can be continuously lit.

Except for the mode keys, all of the other keys in the Lower Control Group can only be set in one of two ways: "on" or "off." Included are the WAVEFORM keys, only one of which can be "on" at any given time. To the right of the WAVEFORM keys are three manual keys: MANUAL BREATH, MANUAL PAUSE and EXPIRATORY HOLD. These keys function only when the clinician actually presses them. To the right are special control options which operate for a period of time after the clinician activates the keys. Included among these are: 100% O_2, and NEBULIZER.

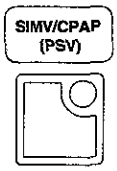


Assist CMV

Panel Group: Lower Controls
Range: on, off, setup
ASSIST CMV LED illuminates to indicate the ventilator is operating in the Assist Controlled Mechanical Ventilation mode.

During Assist CMV operation, both flow augmentation and volume augmentation are operational. All controls are options in this mode except:

- PRESSURE SUPPORT
- MMV LEVEL
- INSPIRATORY TIME
- INSPIRATORY PRESSURE (only operational when PRESSURE AUGMENT is on).



SIMV/CPAP (PSV)

Panel Group: Lower Controls
Range: on, off, setup
SIMV and CPAP are operational when the LED located on the SIMV/CPAP (PSV) key is lit. To operate in CPAP, turn the RATE control to zero. Any RATE setting above zero causes the ventilator to deliver some volume-controlled breaths; thus the ventilator will be in the SIMV mode.

To turn on pressure support during SIMV or CPAP, set the PRESSURE SUPPORT above zero. Now, all demand (not volume-controlled) breaths meeting the ASSIST SENSITIVITY trigger are pressure-supported.

Pressure Control

Panel Group: Lower Controls
Range: on, off, setup
PRESSURE CONTROL is on when its key LED is lit. See a description of PRESSURE CONTROL in Section 4.

Note that PRESSURE CONTROL can sense patient effort and synchronize triggering of pressure-controlled breaths with patient demand. Controls not available in this mode include:

- TIDAL VOLUME
- PEAK FLOW
- PRESSURE SUPPORT
- MMV LEVEL
- COMPLIANCE COMP
- WAVEFORMS
- SIGHS
- PRESSURE AUGMENT

PC-SIMV/CPAP (PSV)

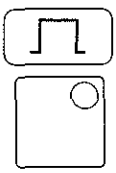
Panel Group: Lower Controls
Range: on, off, setup
PC-SIMV and CPAP are operational when LED located on the PC-SIMV/CPAP (PSV) key is lit. Once activated, independent adjustment of inspiratory pressure (pressure control) and pressure support is available. To operate in CPAP, turn the RATE control to zero. Any rate setting above zero causes the ventilator to deliver some pressure controlled breaths, thus the ventilator will be in the PC-SIMV mode.

To turn on pressure support during PC-SIMV or CPAP, set PRESSURE SUPPORT control above zero. Now, all demand (not pressure controlled) breaths meeting the assist sensitivity or flow trigger levels are pressure-supported.

WAVEFORMS

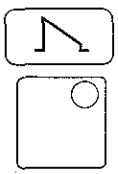
Panel Group: Lower Controls
Range: Square, Decelerating, Sine
Default: Square
Modes Used in: All (except Pressure Control and PC-SIMV)

The WAVEFORM keys enable the clinician to select the FLOW pattern delivered during any volume-controlled breath. Three waveforms are available in the BEAR® 1000 Ventilator (Square, Decelerating and Sine). Only one waveform can function at any given time. If the patient demands more flow than this set PEAK FLOW level, the flow is augmented and the waveform deviates upward from the flow pattern.



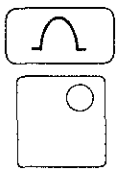
Square

The square waveform causes constant flow delivery at the clinician-selected PEAK FLOW level for the entire inspiratory phase of the breath.



Decelerating

The decelerating waveform causes the flow to rapidly reach its set PEAK FLOW level, and then this flow decreases linearly until it reaches approximately 50% of its peak.



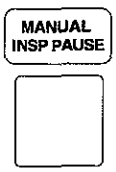
Sine

The sine waveform causes the flow to increase from zero to the PEAK FLOW setting and back to zero in a sinusoidal pattern during the inspiratory phase of a breath.

Manual Breath

Panel Group: Lower Controls
Range: Triggers one breath when pressed
Modes Used in: All
MANUAL BREATH enables the clinician to deliver a single breath by the touch of this key. During Assist CMV, SIMV and CPAP, this single breath is volume-controlled. During operation in the Pressure Control and PC-SIMV modes, this single breath is pressure-controlled.

In any of these modes, this manually triggered breath will only be initiated if the key is pressed during exhalation. In all modes, the delivery of a manual breath resets the breath time period.

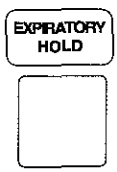


Manual Insp Pause

Panel Group: Lower Controls
Range: Triggers a pause during the next current breath, only while being pressed
Modes Used in: Assist CMV and SIMV/CPAP
MANUAL INSP PAUSE enables the clinician to create a pause at the end of the inspiratory phase of the patient's current or inspiration. The pause takes effect:

1) only for volume-controlled breaths,
2) only at the end of inspiration,
3) only so long as the manual pause key is being depressed.

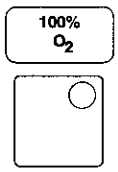
A 2-second time limit constrains the length of a manual pause, even if the clinician continues to press the MANUAL INSP PAUSE key. This key allows the clinician to obtain measures of end-of-pause inspiratory pressures for use in static compliance calculations. The PLATEAU pressure monitor is useful for obtaining end-of-pause pressure readings.



Expiratory Hold

Panel Group: Lower Controls
Range: "on" only while being pressed
Modes Used in: All
EXPIRATORY HOLD enables the clinician to close the exhalation valve and prevent a new breath from being triggered for a period not greater than 9 seconds after the end of exhalation when the subsequent breath would have been triggered.

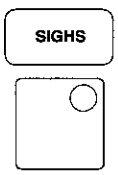
This control is only effective during the expiratory phase of a breath cycle, and can be used to measure intrinsic PEEP (also called auto-PEEP or air trapping) when the clinician depresses the hold key toward the end of exhalation. Once depressed and held, this function waits until the exact time when the next mechanical breath would have been delivered. It then closes the exhalation valve and delays the next breath. No leak makeup or demand flow is delivered while this key is depressed.



100% O2

Panel Group: Lower Controls
Range: on, off
Modes Used in: All
Press the 100% O2 to set the blender to deliver pure oxygen to the patient until the key is pressed again or the 3-minute time limit elapses.

Once this key is turned off, either by the clinician or by the elapse of the 3-minute time limit, as indicated by the key LED turning off, the blender setting reverts to the clinician selected O2% established in the Upper Control Group. (Note that the 3.5 liter accumulator in the BEAR® 1000 Ventilator imposes a short delay in the delivery of 100% O2 to the patient.) The washout volume (to effect 90% of an O2% step change) is 17.5 liters.



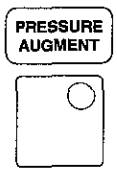
Sighs

Panel Group: Lower Controls
Range: on, off
Modes Used in: All (except Pressure Control and PC-SIMV)
Turning on the SIGHS control causes a single sigh to be delivered every 100th breath. Thus, after 99 breaths (of any type) have been delivered, a sigh breath is delivered in place of the very next volume-controlled breath. During CPAP, the only volume-controlled breaths delivered result from a clinician-initiated MANUAL BREATH or from MMV backup breaths. As a result, sighs are infrequent during CPAP.

The sigh breath volume will be 150% of the normal TIDAL VOLUME setting established by the clinician in the Upper Control Group, and the high pressure alarm limit for this sigh breath is 150% of the clinician-set high PEAK INSP PRESSURE level to a maximum of 120 cmH2O.

During operation in the Assist CMV mode, the sigh breath

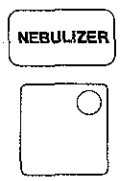
interval is twice as long as the normal breath interval (as established by the RATE setting.) During SIMV, however, the breath interval does not change for a sigh breath. Sighs continue to be delivered until the clinician turns this key off.



Pressure Augment

Panel Group: Lower Controls
Range: on, off
Modes Used in: All (except Pressure Control and PC-SIMV)
Turning on PRESSURE AUGMENT causes all volume-controlled breaths to become volume-*guaranteed* breaths which are pressure augmented to the inspiratory pressure level set by the sum of INSPIRATORY PRESSURE plus PEEP.

PRESSURE AUGMENTATION is effectively a pressure-supported-volume-guaranteed breath. Thus, the clinician can provide PRESSURE SUPPORT while at the same time guaranteeing a certain minimum tidal volume.



Nebulizer

Panel Group: Lower Controls
Range: on, off
Modes Used in: All
Supply Pressure: 10 psig
The NEBULIZER allows the clinician to use the nebulizer port to deliver aerosolized medication simply and efficiently. The nebulizer port only operates during the inspiratory phase of a breath. In addition, the nebulizer port only operates while the flow (as determined by PEAK FLOW and either the WAVEFORM or PRESSURE SLOPE) exceeds approximately 20 liters per minute. Thus nebulized gas is delivered during the inspiratory phase of even spontaneous or pressure-supported breaths, as long as this flow criteria is met.

The nebulizing gas is provided at 10 psig and at approximately 6 liters per minute. The precise flow rate depends upon the nebulizer being used with the ventilator. In spite of these variations, the BEAR® 1000 Ventilator always assumes an exact 6 LPM flow through the nebulizer port, and subtracts 6 LPM from the flow that would otherwise be delivered through the port labeled "Main Flow To Patient."

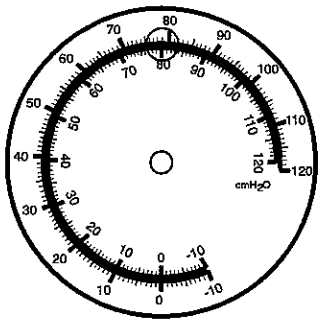
The nebulizer port continues to operate until it is turned off (by a press of its key) or until it automatically cancels after 30 minutes.

Lower Tidal Volume Feature

With the lower tidal volume option, the nebulizer will be enabled at 10 liters per minute for all applications.

OTHER CONTROLS

The only control not part of the Control Group is the PEEP control knob. This knob is located directly beneath the manometer gauge, and its PEEP setting level is read off this manometer.



Analog Manometer

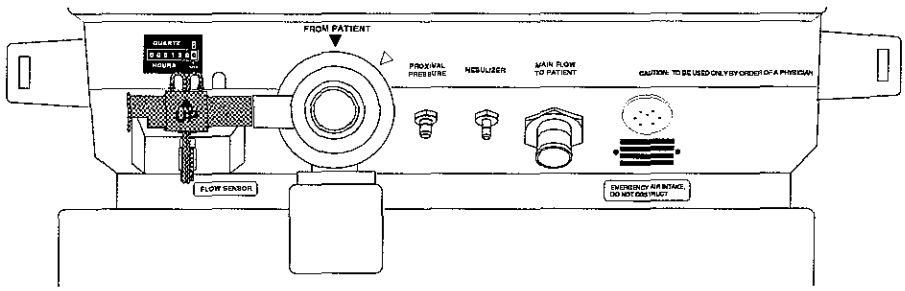
Location: Adjacent to Monitor and Alarm Panels
Range: -10 to 120 cmH2O
Modes Used in: All
The analog manometer provides a continuous display of the proximal pressure. For convenience in identifying certain key pressure parameters, elements of this same pressure reading also display in the digital PRESSURE monitors. Included among these LED readouts are:

- PEAK PRESSURE,
- MEAN PRESSURE, and
- PLATEAU PRESSURE.

PEEP

PEEP Control Knob

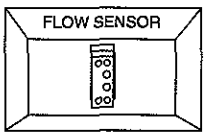
Location: Adjacent to Monitor and Alarm Panels
Range: 0 to 50 cmH2O
Modes Used in: All
This Positive End Expiratory Pressure control is located just beneath the analog manometer and can be monitored directly by this gauge. It serves to maintain a minimum baseline pressure in the circuit at all times, and it can even maintain baseline during leaks (by way of leak makeup).



FRONT FACE

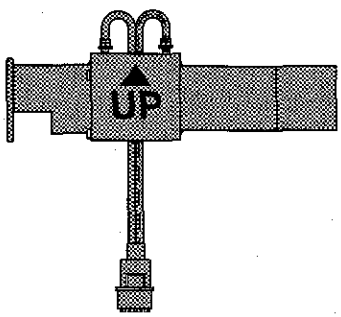
Elapsed Hour Meter

Location: Front face
Range: 0.0–99,999.9 hours
Increment: 0.1 hours
The ELAPSED HOUR METER records the total hours of ventilator operation. It activates when the ventilator is both plugged in and turned on.



Flow Sensor Receptacle

Location: Front face
The differential pressure data and flow sensor characterization information is transmitted to the ventilator through this connector labeled "Flow Sensor." The monitored Exhalation Volumes are based solely upon transducer readings during the exhalation phase of each breath. If the flow sensor cable is not connected to this port, the RUN DIAGNOSTIC alarm LED flashes.



Flow Sensor

Location: Front face
The Flow Sensor is a variable orifice, differential pressure pneumotach which is installed into the Exhalation Valve Manifold. During operation, a self calibrating feature insures that measurement accuracy is maintained

CAUTION

Do not dry the flow sensor with high pressure gas. Doing so can damage the sensor.

CAUTION

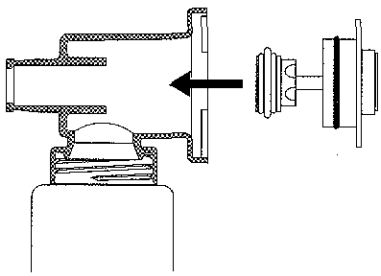
The flow sensor must be installed with the pressure sensing tubes and arrow pointing up. Failure to do so may result in condensate accumulating in the tubes and affecting volume measurement.

The BEAR® 1000 Ventilator continues to operate even without a connected flow sensor. In the absence of a flow sensor, the LOW TOTAL MINUTE volume alarm sounds unless set to zero. In addition, if the flow sensor is removed and the MMV level is set above zero, the monitored minute volume will be zero causing the MMV backup rate used by the ventilator to trigger breaths. Otherwise ventilation continues normally.

NOTE

A flow sensor must be installed and connected for the Flow Trigger feature to operate.

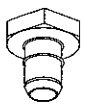
The ventilator automatically purges the flow sensor pressure sense lines every 1 minute. However, when the flow sensor is connected, disconnected or at power-up, a longer purge of 10 seconds will occur. Flow sensing is suspended at this time.



Exhalation Valve Assembly

Location: Front face

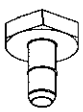
The Exhalation Valve assembly consists of the Port, Diaphragm Mounting, Diaphragm, Manifold and Condensate Jar. The Exhalation Valve controls the breath phase (inspiratory vs. expiratory) as well as the PEEP applied during exhalation.



Proximal Pressure Port

Location: Front face

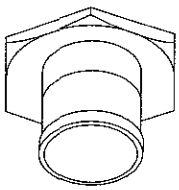
The Proximal Pressure Port (for 1/4" ID tubing) feeds the proximal pressure monitor. See Section 3 for diagrams of circuit setup. A proximal purge flow of 100 ml/min minimizes any moisture or contaminant migration up the proximal line.



Nebulizer Port

Location: Front face

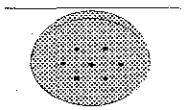
The Nebulizer Port (for 3/16" ID tubing) supplies the nebulizer with 10 psig of pressure and an approximate flow of 6 liters per minute.



Main Flow To Patient Port

Location: Front face
The Main Flow Port provides the main inspiratory flow of gas to the patient.

During a volume-controlled breath with the nebulizer turned on, peak flow through this Main Flow Port equals that determined by the clinician-selected PEAK FLOW and WAVEFORM settings *minus* the 6 LPM flow assumed to be supplied through the nebulizer.



Alarm Speaker

Location: Front face
The Alarm Speaker generates audible alarms. The loudness level for alarms is adjustable between 65 and 83 dB(A).

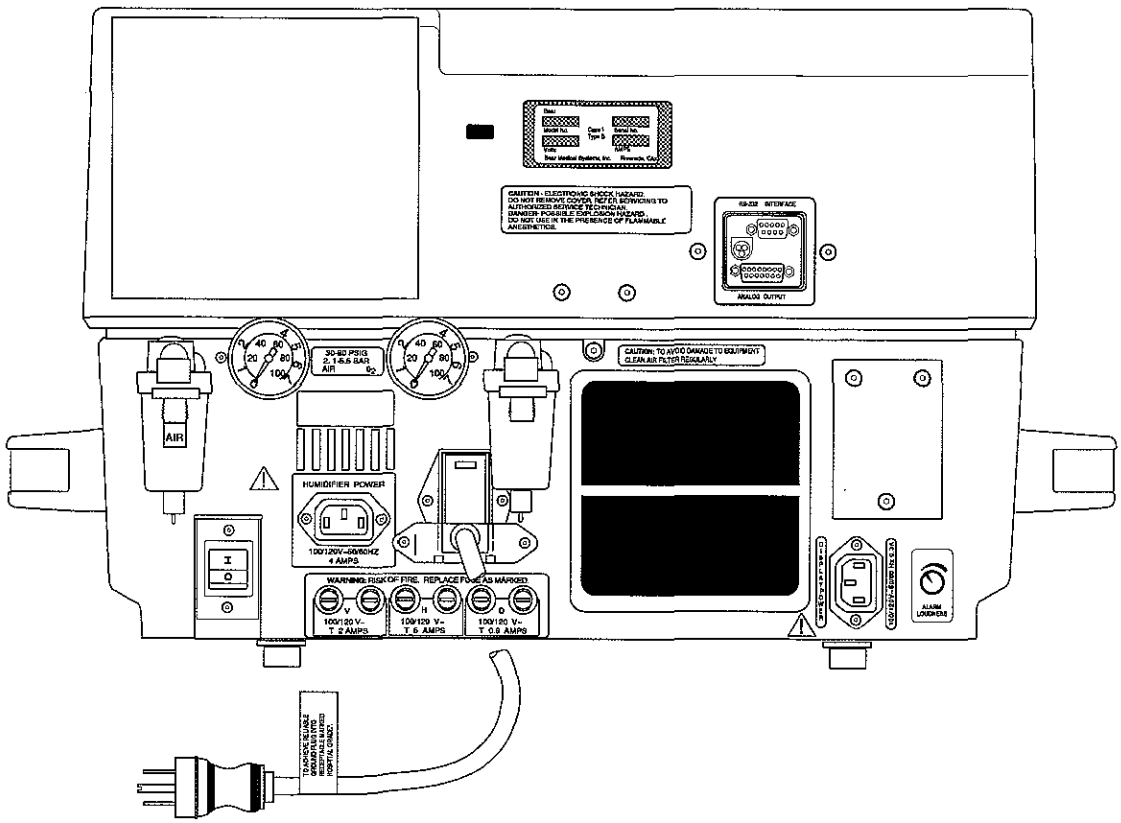
EMERGENCY AIR INTAKE,
DO NOT OBSTRUCT

Overboard Exhaust Port

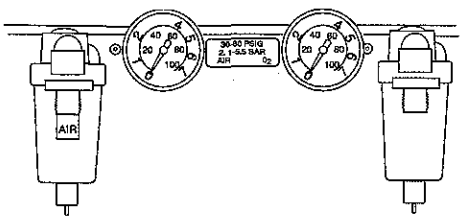
Location: Front face
The Overboard Exhaust Port serves several functions. First, it provides a source of room air for the patient to breathe during the operation of the SOPR adverse pressure relief system (upon a power failure, "PHP" alarm or FAILED TO CYCLE alarm). Second, it serves as an exhaust port for the SOPR valve. Last, it serves as an exhaust port for other smaller pneumatics within the ventilator.

WARNING

Do not block or occlude the Overboard Exhaust Port. Doing so may compromise the SOPR mechanism, and may also cause internal pneumatic malfunction.



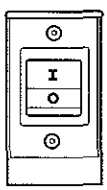
REAR PANEL



Air and Oxygen Inlets, Gauges, Water Traps

Location: Rear Panel
Air and O2 inlet fittings, gauges and water traps provide the connection for the ventilation gas sources. Gases must be supplied at pressures between 30 and 80 psig with a minimum flow capability of 80 LPM.

Note that any condensate in the water traps is a warning signal that condensate may be entering the ventilator.

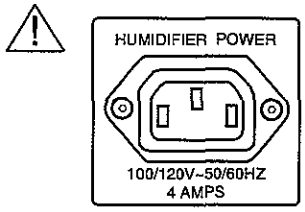


Power On/Off Switch

Location: Rear Panel
When the power is turned on, the BEAR® 1000 Ventilator:

1) Goes through a brief electronic self-check, and
2 Switches on the AC outlets for both the humidifier and the optional BEAR® Graphics Display.

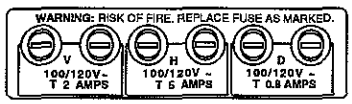
The humidifier and optional graphics display both shut off when the ventilator turns off.



Humidifier Power AC Outlet

Location: Rear Panel
The AC Humidifier connector is a 500-watt maximum international standard plug (conforming to IEC-320). It only supplies power to the humidifier when the ventilator is on.

The connection of equipment to these auxiliary mains socket outlets may increase the patient leakage currents to values exceeding the allowable limits in the event of a defective protective earth.



Fuses

Location: Rear Panel
Two fuses are located on the rear of the ventilator for each of the following:

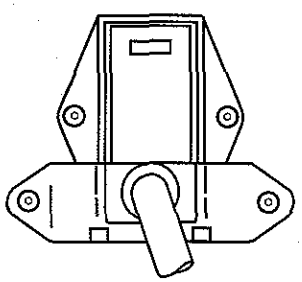
1) the ventilator itself,
2) the Humidifier AC outlet, and
3) the optional BEAR® Graphics Display.

The fuses to be used are as follows:

Two Fuses for:

Supply Voltage	Ventilator	Humidifier	Display
100/120	2 amp	5 amp	0.8 amp
220/240	1.25 amp	2.5 amp	0.4 amp

To replace these fuses, use a screwdriver to push in and turn the fuse holder counterclockwise until it disengages. Retain the cap which holds the fuse, and replace the fuse in the cap with a new, appropriately rated fuse. Insert the cap back into the ventilator. Using a screwdriver, press it in, and rotate it clockwise.

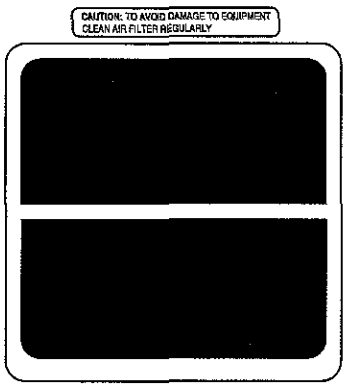


Power Inlet Module

Location: Rear Panel
The power inlet module has an international standard plug (conforming to IEC-320). Backup power amounting to more than 300 milliseconds allows the BEAR® 1000 Ventilator to continue operating during temporary power outages, without sounding a FAILED TO CYCLE alarm. Backup power is not provided to the humidifier or the optional BEAR® Graphics Display power outlets.

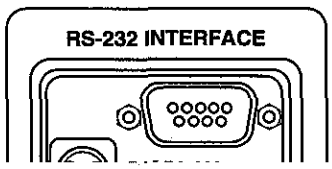
The BEAR® 1000 Ventilator is available with the following power inlet module configurations:

Volts	Hertz
100	50 or 60
120	50 or 60
220	50 or 60
240	50 or 60



Fan & Filters

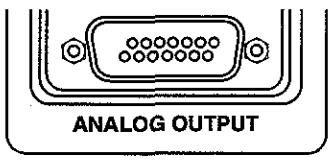
Location: Rear Panel
The fan draws room air into the ventilator enclosure to cool the components.



RS-232 Digital Communication Interface

Location: Rear Panel
The RS-232 9-pin female connector permits the ventilator to digitally communicate with a central monitor, a computer or the BEAR® Graphic Display.

Available baud rates are: 1200, 2400, 9600 and 19,200. Refer to Section 2 for changing the baud rate.



Analog Output

Location: Rear Panel Lid
The Analog Output 15-pin female connector provides analog signals of pressure, flow and a Logic Signal for Remote Alarm.

Proximal Pressure (Signal Pin 1, Ground Pin 2)
Pressure Range: -60 to 140 cmH_2O
Scale: 1 cmH_2O/25mV
Zero: 1.5 VDC at 0 cmH_2O

Flow (Signal Pin 3, Ground Pin 4)
Flow Range: -300 to 200 LPM
Scale: 1 LPM/10mV
Zero: 3 VDC at 0 LPM

Inspired flows are positive signals, based upon machine-delivered flows. Exhaled flows are negative signals, based on exhaled flow sensor readings.

Remote Alarm (Signal Pin 5, Ground Pin 6)

The remote alarm is not implemented as standard nurse call as on our other products. It is a logic signal and is logic high under normal conditions and logic low when any alarm condition exists. The active low alarm condition was chosen so that a remote alarm would always exist when power is lost.

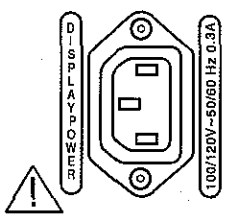
NOTE

Special cabling is required to interface the remote alarm feature of the BEAR® 1000 Ventilator to the hospital nurse call system. To support system differences in plug styles, two cable configurations are made available for purchase.

- P/N 51000-09855 - BEAR® 1000 Ventilator nurse call cable assembly kit (phone plug)
- P/N 51000-09856 - BEAR® 1000 Ventilator nurse call cable assembly kit (RJ 45 modular plug)

Display Power (BEAR® Graphic Display P/N 50000-20000)

Location: Rear Panel
Provides 35 volts D.C. to power the BEAR® Graphic Display. It only supplies power when the ventilator is on. No backup power is provided to the display.



Display Power AC Outlet (BEAR® Graphic Display P/N 50-08800-00)

Location: Rear Panel
The AC outlet for the BEAR® Graphic Display has a 100-watt maximum international standard plug (conforming to IEC-320). It only supplies power to the BEAR® Graphics Display when the ventilator is on. No backup power is provided to the display.

⚠ The connection of equipment to these auxiliary mains socket outlets may increase the patient leakage currents to values exceeding the allowable limits in the event of a defective protective earth.

Alarm Loudness

Location: Rear Panel
Range: 65 to 83 dB(A)
The Alarm Loudness knob adjusts the volume of the audible alarms. Turn clockwise to increase volume, and counterclockwise to decrease.

MISCELLANEOUS

PHYSICAL SPECIFICATIONS

Weight
Ventilator. . . . . 54 lbs.
Graphic Display. . . . . 5.5 lbs.
Cart . . . . . 55 lbs.
Compressor. . . . . 114 lbs.

Dimensions
Ventilator. . . . . 23"W x 13.5"D x 15"H
Graphic Display. . . . . 13.5"W x 2.5"D x 9.5"H
Cart . . . . . 19"W x 23"D x 31.5"H
Compressor. . . . . 22.5"W x 23.6"D x 33"H

ENVIRONMENTAL SPECIFICATIONS

Temperature:

Storage & Shipping: –31 to 158°F (–35 to 70°C)

Checkout & Operating: 50 to 104°F (10 to 40°C)

Altitude:

Checkout & Operating: 0 to 9,000 ft (0–2,743 m)

Humidity:

Storage & Shipping: 0 to 99% Relative Humidity non-condensing

Checkout & Operating: 0 to 95% Relative Humidity non-condensing

PNEUMATIC SPECIFICATIONS

Supply Air and Oxygen:

Pressure: 30 to 80 psig

Dew point of gas should be at least 3°F below the ambient temperature.

Temperature: 50 to 104°F(10-40°C)

Minimum Flow: 80 LPM

Inlet Gas Filtering Capability:

Particulate size of 0.7 microns with 95% efficiency. Water vapor is not removed either by the water trap or the filter.

Inlet Fittings:

Supply Air: CGA-DISS body type, No. 1160

Supply Oxygen: CGA-DISS body type, No. 1240

The BEAR® 1000 is designed to perform to a maximum Minute Volume of 50 LPM. This requires that the gas sources have sufficient capacity to supply a minimum pressure of 30 psig at flows reaching 80 LPM. This will accommodate the following ventilation settings:

2.0L Tidal Volume

25 BPM

150 LPM Peak Flow

SIGH ON

Nebulizer ON

Depending on the integrity of the patient circuit, the parameters above will be degraded by the level PEEP applied. Gas sources failing to meet these requirements will degrade the performance in some or all of these parameters. Gages located in the rear of the ventilator display the supply pressures being provided to the ventilator. At no time should a gas source with less than a minimum of 30 psig (at the ventilator) be used to power the BEAR® 1000 Ventilator.

ELECTRICAL SPECIFICATIONS

Voltage (AC)	Nominal	Range	Frequency	Amps
Ventilator	120	95–135	50 or 60	2
Alone	100	80–110	50 or 60	2
	220	176–242	50 or 60	1
	240	192–264	50 or 60	1
& VH820	120	95–135	50 or 60	5
Humidifier	100	80–110	50 or 60	5
	220	176–242	50 or 60	2.5
	240	192–264	50 or 60	2.5
Graphic Display	120	95–135	60	.8
	100	80–110	50 or 60	.8
	220	176–242	50 or 60	.4
	240	192–264	50	.4

Leakage Current: 100 micro amps maximum (including the ventilator, VH 820 humidifier and graphics display, but not the separately powered compressor.)

Voltage Drops: of 300 milliseconds or less will not affect normal operation of the ventilator.